

William E. Thornton Papers

PC.2054

Finding aid prepared by Ken Dasher

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Describing Archives: A Content Standard

State Archives of North Carolina
2012; 2014
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Summary Information

Repository	State Archives of North Carolina
Creator	Thornton, William Edgar
Title	William E. Thornton Papers
Date [inclusive]	1950-2009
Extent	14.0 cubic feet
Language	English

Dr. William Edgar Thornton was born in 1929 Faison, North Carolina. After receiving a BS in physics at the University of North Carolina at Chapel, he was commissioned in the U.S. Air Force where he helped develop air-to-air missile combat radar systems for fighter pilots. Thornton helped organize and then directed Del Mar Engineering's avionics division. He then went to medical school, again at University of North Carolina. Dr. Thornton then rejoined the Air Force to pursue research in aerospace medicine, and continued that work with NASA where he served on Skylab missions and as a mission specialist on two space shuttle missions aboard the Challenger.

Papers consist of materials created by or collected by Dr. William E. Thornton during his career in U.S. Air Force, Del Mar Avionics, medical school, and at NASA. These records concern Dr. Thornton's interests and professional work. Materials include his work developing the Radar Optical Firing Error Indicator for the Air Force to train fighter pilots in air-to-air missile combat. They also include his research in medical subjects like telemetry, cardiography, nuclear magnetic resonance, and aerospace exercise. Dr. Thornton's medical interests continued from his studies in medical school all the to the end of his career with NASA as

he investigated aspects of these subjects in aerospace medicine. The collection is made up of correspondence, research, patent paperwork, news clippings, photographic prints and negatives, and film footage of early test projects, with the dates ranging from 1950 to 2009.

Preferred Citation

[Identification of item], in PC.2054, Dr. William E. Thornton Papers, State Archives of North Carolina, Raleigh, NC, USA.

Biographical Note

William Edgar Thornton was born in Faison, North Carolina on April 14, 1929. He received a BS in physics at the University of North Carolina at Chapel Hill in 1952. Upon graduation, Thornton was commissioned as an officer in the U.S. Air Force and serve as the officer-in-charge of the Instrumentation Lab at the Flight Test Air Proving Ground at Eglin Air Force Base. There he helped develop the Radar Optical Firing Error Indicator (ROFEI) system to aid in air-to-air combat training. In 1956 he joined Del Mar Engineering Labs to organize and direct the company's Avionics Division. While at Del Mar, Thornton continued as a consultant with the Air Force at Air Proving Ground Command. Thornton's association with Del Mar Avionics has continued throughout his career.

He returned to the University of North Carolina in 1959 to pursue medicine, and received his MD in 1963. While in medical school, Thornton helped develop telemetry systems for medicinal use. Dr. Thornton returned to active duty with the Air Force and was assigned to the Aerospace Medical Division at Brooks Air Force Base near San Antonio, Texas. In 1967 Dr. Thornton applied and was selected for astronaut training with the National Aeronautics and Space Administration (NASA). Dr. Thornton developed and designed the first mass measuring devices for space. Dr. Thornton was a physician crew member of the Skylab Medical Experiments Altitude Test, as well as a member of the astronaut support crew for the Skylab 2, 3, and 4 missions performing experiments in mass measurement, anthropometric measurements, hemodynamics, and physical conditioning.

Dr. Thornton is a veteran of two spaceflights, both on board the Challenger shuttle, logging 313 hours in space. He served as a mission specialist on STS-8 in 1983 and STS-51B in 1985. Dr. Thornton holds more than 35 issued patents ranging from military weapons systems to the first real-time EKG computer analysis. His space-related patents include the first in-flight mass measurement devices and improved lower body negative pressure apparatus such as the Shuttle treadmill for in-flight exercise. Many of his devices are still scheduled for flight. Dr. Thornton retired from NASA in 1994. Dr. Thornton is currently a Clinical Assistant Professor in the Department of Medicine, University of Texas Medical Branch in Galveston, and is also an adjunct professor at University of Houston, Clear Lake.

Collection Overview

The papers consist of materials created by or collected by Dr. William E. Thornton during his career in U.S. Air Force, Del Mar Avionics, medical school, and at NASA. These records concern Dr. Thornton's interests and professional work. Materials include his work developing the Radar Optical Firing Error Indicator for the Air Force to train fighter pilots in air-to-air missile combat. They also include his research in medical subjects like telemetry, cardiography, nuclear magnetic resonance, and aerospace exercise. Dr. Thornton's medical interests continued from his studies in medical school all the to the

end of his career with NASA as he investigated aspects of these subjects in aerospace medicine. The collection is made up of correspondence, research, patent paperwork, news clippings, photographic prints and negatives, and film footage of early test projects. The collection is arranged in the following nine series: 1. U.S. Air Force Test Projects 2. Medical School, University of North Carolina 3. U.S. Air Force Aerospace Medicine 4. NASA 5. Del Mar Engineering 6. Wright State University 7. University of Houston, Clear Lake 8. Unfinished Manuscripts 9. Personal Papers

Collection Arrangement

The collection is arranged in nine (9) series following Dr. Thornton's curriculum vitae as follows: 1. U.S. Air Force Test Projects 2. Medical School, University of North Carolina 3. U.S. Air Force Aerospace Medicine 4. NASA 5. Del Mar Engineering 6. Wright State University 7. University of Houston, Clear Lake 8. Unfinished Manuscripts 9. Personal Papers

Administrative Information

Publication Information

State Archives of North Carolina 2012; 2014

Revision Description

Some editing and finding aid data added by Fran Tracy-Walls September 2014

Access Restrictions

Available for research

Legal Status note

Gift

Copyright Notice

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Acquisitions Information

Dr. William Edgar Thornton, Boerne, Texas, 2010.

Procession Information

Processed by Kenneth Dasher, October 2012 to December 2012.

Finding Aid by Kenneth Dasher, December 2012; some additions made by Fran Tracy-Walls, September 2014.

Related Materials

Related Collections

Additional information on topics found in this collection may be found in the Manuscript and Archives Reference System (MARS) <http://mars.archives.ncdcr.gov/BasicSearch.aspx>

Dr. Thornton has placed many materials dealing with his research in aerospace medicine with the University of Texas Medical Branch at Galveston. Contact the reference desk at the Moody Medical Library at 409-772-2372 for more information.

Controlled Access Headings

Corporate Name(s)

- United States. Air Force.
- United States. National Aeronautics and Space Administration.

Geographic Name(s)

- Brooks Air Force Base (Tex.)
- Eglin Air Force Base (Fla.)
- Lyndon B. Johnson Space Center
- University of Houston--Clear Lake
- University of North Carolina at Chapel Hill
- Wright State University

Personal Name(s)

- Del Mar, Bruce E.

Subject(s)

- Aerospace Medicine
- Cardiography
- Challenger (Spacecraft)
- Del Mar Avionics Corporation
- Del Mar Engineering
- Kinesiology.
- Radar--Military applications.
- Radar--Optical Equipment
- Skylab Program.
- Space Shuttle Program (U.S.)

U.S. Air Force Test Projects

Collection Inventory

U.S. Air Force Test Projects 1953-1956 6.0 boxes Includes 1 box of 4x5 inch photographs, and 3 flat Kentucky boxes containing film footage.

U.S. Air Force Test Projects

This series contains papers, photographs, and motion picture film relating to Dr. Thornton's first term of service with the United States Air Force. Dr. Thornton helped develop the Radar Optical Firing Error Indicator (ROFEI) system to aid in training fighter pilots in air-to-air missile combat. Materials in this series include papers and schematics showing the progression of the ROFEI system, patents related to the system, training films and footage of testing, and photographs of ROFEI hardware and the aircraft used in training.

	Box	Folder
Air Defense Command Unit Proficiency Rocket Firing Training Program (April '54)	1	1
Weapons and Gunnery Meet III Program Interceptor Phase 1954	1	2
Interim Report on Evaluation of Firing Error Indicator	1	3
Technical Schematics 1954	1	4
Aerial Firepower Demonstration May 1955	1	5
Fighter Gunners and Weapons Meet IV Rocketry Phase 1955	1	6
Interceptor Weapons F86D Newsletter 1955	1	7
Yuma Air Promo Pamphlet	1	8
USAF Papers 1953-1955	1	9
USAF Tow Target Patent 2869120	1	10
Patent 2909772	1	11

Medical School, University of North Carolina

Patent 2938201	1	12
Patent 2971274	1	13
Patent 2983915	1	14
Patent 3149328	1	15
Patent 3161877	1	16
		Box
Photographs: Test projects, Equipment and testing missions, hardware, Radop		2
Photographs: Test projects, Radop, Hardware and Testing Missions (4x5), including radar imaging prints; each photo is labeled with item level description on envelope		3
Reel motion picture film 35mm and 16mm; Test missions and firepower demonstrations		4
Reel motion picture film 35mm and 16mm; Test missions and firepower demonstrations		5

Medical School, University of North Carolina 1956-1964 4.0 boxes Includes 2 film cans holding 16 mm film.

Medical School, University of North Carolina

This series contains papers, photographs, and film related to Dr. Thornton's time in medical school at the University of North Carolina in Chapel Hill. Papers include correspondence, research material, and his work on telemetry and telecardiography. Highlights include Dr. Thornton's work in developing the first real-time EKG computer analysis, and his prize-winning Telemetry EXhibit at the 1961 American Medical Association Annual Meeting.

		Box
Rolls of photographic prints of ROFEI test footage including radar imagery		6
	Box	Folder
Correspondence 1954-1962	7	1
Correspondence 1962, and undated	7	2

Medical School, University of North Carolina

Technical Bulletin 1956-1963	7	3
Request for Technical Information 1960-1967	7	4
Med School Papers 1962-1967	7	5
Alumni Association Certificate	7	6
NCMH Health kit Electronic Switch 1956	7	7
Telecardiography	7	8
Holter Research Foundation 1962	7	9
Cardiac Work	7	10
Measurements of the work of the Heart	7	11
Cardiotouch	7	12
EKG Tape Recorder and Cardiotouch	8	1
Telecardiography Mini Tape Recorder	8	2
EKG Telemetry	8	3-14
AMA Annual Meeting Program 1961	8	15
Telemetry Exhibit AMA Annual Meeting 1961	8	16
AMA Bulletins on Meetings (Photos) 1961	8	17
Plastics for Electronics 1961	8	18
Gastric Reflectometer 1961	8	19
Magnetic Flowmeter	9	1
Nuclear Magnetic Resonance	9	2
Medical Reference Material	9	3
Photographic Slides	9	4

U.S. Air Force Aerospace Medicine

UNC Early Medical Monitoring (Photographs included)	9	5-9
Electrocardiac Computer Patent 3267934	9	10
EKG Study film reels		Box 10
EKG Study film reels		11

U.S. Air Force Aerospace Medicine 1965-1967 4.0 boxes**U.S. Air Force Aerospace Medicine**

This series contains materials tracing Dr. Thornton's continuing research in cardiography, telemetry, noise, nuclear magnetic resonance, and galvanic skin response as those investigations relate to the aerospace medicine. Also included are patents Dr. Thornton developed for the Air Force during this time.

		Box
Various folders containing certificate in training in aerospace med; Absorption/ photometry; blood flow; spectrophotometric studies; photometric/oxygen saturation/ blood; spectral transmission red blood cells; multiple scattering of waves and optical phenomena; telemetry; manuscript- Personal Telemetry for Spacecraft; NMR		12
	Box	Folder
Neural Aerospace Studies	13	1
Artificial Neurons	13	2-4
Earpiece Filters	13	5
Earpiece Theory	13	6
Noise/Dosimeter	13	7
Electrodes	13	8
Pneumo Cardiography	13	9
Microcoolometer	13	10

NASA

Audiometry	13	11-12
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Box

Galvanic Skin Response and EEG		14
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Operated Amplifiers		15
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NASA 1967-2000 7.0 boxes**NASA**

This series contains papers and photographs related to Dr. Thornton's career with the National Aeronautics and Space Administration (NASA). Dr. Thornton joined NASA in 1967 and retired in 1994. While at NASA, Dr. Thornton was involved with the Skylab missions, and served as a mission specialist on board the Space Shuttle Challenger during missions STS-8 and STS-51B. Papers in this series include correspondence, news clippings, reports and recommendations based on Dr. Thornton's research in aerospace medicine and kinesiology, newsletters, materials about the missions Dr. Thornton worked on, patents that Dr. Thornton developed for NASA, and a visual acuity study that he performed. Photographs in this series include official astronaut portraits, official mission prints from the Apollo missions, Skylab missions, and shuttle launches, and prints of Dr. Thornton performing experiments in space on board the Challenger shuttle. Two oversized awards have been placed in a flat box holding other certificates from the series of Dr. Thornton's personal papers. They are the Apollo Soyuz Test Project Award, 1975; and a NASA Superior Achievement Award for Phase Training Completion, 1977.

Box

Correspondence; Memoranda 1974-82; Rationale for Exercise in Space Flight; Dynamic Anthropometry; Bio Data of Astronauts; Newsletters; Voyager I Conference; SMEAT 1872; Skylab Awards; Test Project; Spacelab II Candidates; Crew Selection and Training; Telescope 1978; Spinoff Annual Report 1978; Polaroid's; Prints; Portraits; NAS Mission Official Prints and portraits including Dr. Thornton conducting research		16
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Guest Lecture Program; News clippings 1967-83; Aviation and Space Tech Clippings; News clippings Medical; Periodicals on Cardiovascular Disease; Medical Pamphlets; NASA Manual Trackmaster; Bioenergetics of Space Suits for Lunar Exploration; Blood Pressure; Blood Flow; Blood Volume; Noise Mgmt; Optical Instrumentation; Ergometers;		17
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Del Mar Avionics

Infrared Comm. / Photo Divides; Telemetry Exhibit AMA Annual Meeting 1961; NMR;
Automatic Detection of Sleep EEG

Patents; Articles used in research; audio research (13 folders); Effect of Light (6 folders) 18

Light Sensors (10 folders); Correspondence with Joe Kerwin 2006-09 (5 folders) 19

Boxes

Visual Acuity Study 20-22

Del Mar Avionics 1950-2008 7.0 boxes**Del Mar Avionics**

This series contains materials related to Dr. Thornton's professional relationship with Del Mar Engineering (now Del Mar Avionics). Dr. Thornton began working with the company during his first stint in the Air Force while developing the ROFEI system. He subsequently went to work for the company to organize and direct their Avionics Division. Dr. Thornton maintained an ongoing professional interaction with Bruce Del Mar and his company throughout his career. Contents of this series include correspondence, security clearances, contracts, company data, product brochures, and patents related to Dr. Thornton's work with Del Mar. Highlights of this series include Del Mar's work on the Radar Optical Scorer during the mid 1950s, cardiographic research and work on the Holter Recorder, and research into a caloric balance weight control system for diabetics.

Box

Correspondence 1951-1989 23

Correspondence 1990-2008; Company Data; Employment Agreement; Security Clearance
1962-1967 24

Organization Sales Contracts and Product Support Dept.; Service Instructions; Radar Set;
Radar Optical Scorer Work with USAF 25

Radar Optic Scorer Handbooks and Brochure; Radar System Prints; Periodicals; Simple
Computer Techniques in Data Recording; Gas Analyzer Research 26

Computation Notebooks; Cardio Research- Holter Recorder; Dynamic ECG 27

University of Houston, Clear Lake

Research; Travel; Company Events; Patents; Photographs 28

Company Product Brochures (both radar and medical) 29

University of Houston, Clear Lake 1989-1990 1.0 boxes

University of Houston, Clear Lake

This series contains materials relating to the biology course Dr. Thornton taught at the University of Houston at Clear Lake in 1989 and 1990. The course was titled Human Factors in Manned Space Flight. Papers include lecture notes, attendance rosters, and student grades.

Box

Biology Course Outlines, Tests, Grades 30

Wright State University 1991-1996 1.0 boxes This series concerns Dr. Thornton's effort to place papers dealing with his work at NASA with the archives at Wright State University in Dayton, Ohio.

Wright State University

This series contains papers relating to Dr. Thornton's efforts to place records of his work with NASA at Wright State University in Dayton, Ohio.

Box

Correspondence and Papers 1991-1996; Ross A. McFarland Collection info 31

Unfinished Manuscripts 2.0 boxes

Unfinished Manuscripts

This series contains work on three books that Dr. Thornton began but never finished. The first is an autobiography that Dr. Thornton titled The Moon Has Two Faces. Dr. Thornton produced about four chapters that covered his career with Air Force and medical school. The second unfinished manuscript was to be a book entitled Man In Space. The third manuscript described The Human Body in Weightlessness.

Personal Papers

These two works seem to have developed out of Dr. Thornton's teaching at University of Houston at Clear Lake.

Box

Moon has Two Faces

32

Man in Space; Human Body in Weightlessness; 1989 CV; Radio Repair; Correspondence;
Articles and News clippings; Awards

33

Personal Papers 2.0 boxes Includes one flat box.

Personal Papers

This series contains papers outside of Dr. Thornton's professional career. One exception is a detailed curriculum vitae covering Dr. Thornton's career through 1989. The other papers in this series include certificates and community honors Dr. Thornton received, papers on Dr. Thornton's interest in radio repair, newsclippings, and magazine articles.

Flatbox

Oversized Awards and Certificates from NASA, UNC, and Texas

34